



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/973,107	10/09/2001	Andreas Bulan	LeA-34,897	5590
23872	7590	10/06/2003		
MCGLEW & TUTTLE, PC SCARBOROUGH STATION SCARBOROUGH, NY 10510			EXAMINER NGUYEN, NGOC YEN M	
			ART UNIT 1754	PAPER NUMBER

DATE MAILED: 10/06/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/973,107

Applicant(s)

BULAN ET AL.

Examiner

Ngoc-Yen M. Nguyen

Art Unit

1754

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 October 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

Art Unit: 1754

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 8-10 are rejected under 35 U.S.C. 102(b) as being anticipated by Ingle et al (4,526,769).

Ingle '769 discloses a method for producing HSiCl_3 , which comprises the steps of:

Providing a two stage reactor, the first stage of said reactor maintained at a temperature of about 500-700°C and the second stage of said reactor maintained at a temperature of about 300-350°C

Charging each of said first and second stages with silicon particles;

Flowing a mixture comprising hydrogen and silicon tetrachloride through said silicon particles in said first stage and reacting said hydrogen, silicon tetrachloride and silicon to cause a partial hydrogenation of said silicon tetrachloride;

Adding HCl to the effluent from said first stage and passing said effluent and HCl through said silicon particles in said second stage (note claim 1).

The pressure in said reactor is maintained at about 25-60 psi (= 1.7-4.1 bars) (note claim 15).

The HSiCl_3 formed is used to produce semiconductor grade silicon (note Figure 1, box 82).

Art Unit: 1754

Ingle '769 further teaches that the silicon particles are admixed with a catalyst (note claim 6)

As to the limitation of "intensively mixed", it is noted that in the instant specification, it is disclosed that during the intensive mixing, "the catalyst can be further comminuted", however, this is not a definition of the intensity for the limitation "intensively mixed". The claims are given the broadest reasonable interpretation, i.e., any intended mixing of the catalyst and the silicon particles is considered as "intensive" because there is no clear definition in the instant specification as to how intensive is considered as "intensively mixed". In this instant case, it is considered that the catalyst and the silicon are "intensively" mixed in Ingle '769 because they are purposely mixed prior to being introduced into the reactor and because conversion efficiency and HSiCl_3 throughput were improved by the use of a catalyst mixed with the silicon particles (note column 6, lines 20-23). It is also noted that there is no showing in the instant specification that there is an expected results when the catalyst and the silicon particles are "intensively mixed" as compared when they are just "mixed".

The process of Ingle '769 anticipates the claimed process.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 1754

Claims 1-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ingle '769 in view of Chemical Engineers' Handbook (Fifth edition, pp. 21-30 through 21-36), optionally further in view of Breneman (4,676,967).

Ingle '769 discloses a process for producing trichlorosilane as stated in the above rejection.

For the condition of the mixing of the catalyst and the silicon particles, it would have been obvious to one of ordinary skill in the art to optimize such condition to obtain the best results, i.e. to obtain a mixture, when used in the process of Ingle '769, would provide an increase in conversion efficiency and trichlorosilane throughput.

The differences are (1) Ingle '769 does not disclose the equipment used to mix the catalyst and the silicon particles; (2) Ingle '769 does not disclose that the catalyst can be a metallic oxide such as copper oxide.

For (1), Chemical Engineers' Handbook is applied to teach that the selection of a mixing equipment for solid-solid mixing depends upon the properties of the ingredients (note last paragraph on page 21-30). As shown in Table 21-6 and Fig. 21-44, many of the known mixing equipment have rotating mixing tools.

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to use rotating mixing tools as suggested by Chemical Engineers' Handbook in the process of Ingle '769 because these tools are well known and conventional in the art. Without a showing of criticality or unexpected results, the use of rotating mixing tools to mix the catalyst and the silicon particles is not seen as a patentable difference.

Art Unit: 1754


For (2), Breneman '967 discloses a process for producing high purity silane and silicon (note title). Breneman '967 fairly teaches that copper oxide and copper chloride are analogous catalyst for such process (note column 10, lines 49-62).

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to use copper oxide instead of copper chloride in the process of Ingle '769 because Breneman '967 teaches that these two compounds are analogous catalyst for such process.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ngoc-Yen M. Nguyen whose telephone number is (703) 308-2536. The examiner can normally be reached on Part time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on (703) 308-3837. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.


Ngoc-Yen M. Nguyen
Primary Examiner
Art Unit 1754

Nmn
September 28, 2003